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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/564,584
Filing Date: January 13, 2006
Appellant(s): BIESTER, KLAUS

Carol E. Smith
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 26 October 2010 appealing from the Office action mailed 26 May 2010.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Claims 1-6, 8-13, 16, 33, 35-39, and 42-47 are pending.

Claims 1-6, 8-13, 16, 33, 35-39, and 42-47 are rejected.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the

subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

WITHDRAWN REJECTIONS

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner. The rejections of claims 43 and 47 under 35 U.S.C. 112, first paragraph, are withdrawn. Further, the rejections of claims 12, 43, and 47 under 35 U.S.C. 112, second paragraph, are withdrawn.

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

20020108747	DIETZ	8-2002
4862911	YIE	9-1989
4442395	SALINA	4-1984
1852560	GIESE	4-1932
4398110	FLINCHBAUGH	8-1983
3261591	CAMPBELL	7-1966
6208923	HOMMEL	5-2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6, 8-13, 16, 33, and 35-39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the limitation "a pressure of hydraulic fluid" is positively recited twice, in lines 11 and 14. It is therefore unclear whether the pressures recited are the same or separate.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 10-13, 16, 33, 35, 37, and 42-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dietz et al. (US 2002/0108747) in view of Yie (US 4,862,911) and Salina et al. (US 4,442,395).

Regarding claim 1, Dietz et al. teach a pump device for the hydraulic actuation n of a valve (see Fig. 5) used in the production of hydrocarbons (such as crude oil or

natural gas). In particular, Dietz et al. teach a safety valve (60, 61, 110, see Figs. 2 and 4), and a pump (102, see paragraph 25). Dietz et al. teach that the pump can pump hydraulic fluid in the direction of the valve (to actuate the mechanical linkage 95), and that the pump may be an electric pump (thus comprising an electric drive device). Dietz et al. also teach a discharge pipe (77) and a control valve (104) in a branch pipe (105), and that the discharge pipe (77) delivers the hydraulic fluid to the valve. Dietz et al. teach that the control valve may be opened in order to bleed hydraulic pressure from the actuator (108) to save the bellows from stress imposed by pressure forces (paragraph 26). Dietz et al. do not teach the details of the pump (102), and thus do not teach a piston-cylinder unit. Yie teach a high pressure pump and a valving arrangement therefor. In particular, Yie teach a piston (45) within a cylinder (40), first (31) and second (22) ports of the cylinder. Yie teach that the piston reciprocates, traveling to a first position (as shown in Fig. 1) forcing fluid from the cylinder out the first port (31) and then traveling to a second position (as shown in Fig. 2) drawing fluid through the second port (22) into the cylinder (40). Various piston positions are also taught in Fig. 7. Yie also teaches a drive mechanism (65) for providing the reciprocation, which may be electrical (col. 7, ln. 13-14). As Dietz et al. plainly contemplate that a conventional pump may be used to provide the hydraulic fluid to their safety valve, it would be obvious to one of ordinary skill in the art to use a pump such as that taught by Yie in order to supply that pump. Thus provided, the pump of Yie would pump the hydraulic fluid of Dietz et al., and the first port (31) of Yie would direct the hydraulic fluid toward

the valve under pressure, and would be effectively in fluid communication with the actuator (110) of the hydraulically actuated valve.

Neither Dietz et al. nor Yie teach a discharge pipe pressure sensor. It is well known in the art of hydraulic power supply systems to provide a relief valve to prevent against overpressures in the system (as evidenced by US Patent 4,119,016 to Pfeil et al., which indicates that it is standard practice to provide overpressure protection in the form of a relief valve at the delivery side of a hydraulic fluid source, see col. 1, ln. 15-18), and Dietz et al. is particularly aware of the danger of the exposure to pressure to bellows or piston seals (paragraphs 26, 27). Dietz et al. also teach a discharge pipe (77) and a control valve (104) in a branch pipe (105), and that the discharge pipe (77) delivers the hydraulic fluid to the valve. Dietz et al. teach that the control valve may be opened in order to bleed hydraulic pressure from the actuator (108) to save the bellows from stress imposed by pressure forces (paragraph 26 "preserves the bellows 108 by minimizing the amount of time that the bellows 108 is exposed to a pressure differential"). Salina et al. teach a method of actuating a valve in response to a signal from a pressure switch (col. 2, ln. 3-11). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a pressure sensor in the form of a pressure switch to the discharge pipe (77) of Dietz et al. in order to provide a trigger to release the control valve (104) in the case of an anomalous overpressure, in order to protect the hydraulic system generally, and the bellows or piston seal particularly. In other words, it would be obvious to use the output of a pressure switch

to open the control valve upon exceeding a predetermined value, i.e. a value lower than that likely to damage the components of the hydraulic system.

Regarding claim 10, Yie teaches the piston (45) is adjustably supported (for reciprocation) in a piston chamber (41) of the cylinder, and that the first (31) and second (22) ports are disposed on the face side of the piston chamber (41), and include (constitute) suction (22) and discharge (31) holes, the suction hole (22) opening into an intermediate reservoir (21).

Regarding claim 11, Yie teaches that each hole has a non-return valve (24, 32) extending through a valve member (20, 36) into a cylinder bottom plate (14), the non-return valves being subjected to a (spring) force opposite to the hydraulic fluid flow direction through the respective hole.

Regarding claim 12, Yie teaches that the holes are formed in a cylinder bottom plate (14) releasably fixed on the cylinder (4). According to the combination, the discharge branch is fluidly connected to a pressure switch as taught by Salina et al.

Regarding claim 13, Yie teaches that the suction hole (22) opens into the intermediate reservoir (21) with its end facing away from the piston.

Regarding claim 16, Yie teaches that the discharge pipe (31) is brought out through a volume in direct communication with the intermediate fluid reservoir (21), as shown in Fig. 1.

Regarding claim 33, the pump of Yie consists of several modules (for instance 60, 65, 14) and is thus considered to be of modular construction. Further, according to

the combination, the control valve (104) of Dietz et al. functions as a safety valve communicating with the first port.

Regarding claim 35, Dietz et al. teach a quick-release coupling (47) between a housing of the pump and a hydraulic fluid supply pipe (39).

Regarding claim 37, Dietz et al. teach that the hydraulic fluid is an injection fluid, in that it is injected into the hydraulic valve system by the pump.

Regarding claim 42, Dietz et al. teach that the injection fluid is an inhibitor, at least in that it is used to inhibit the closing of the safety valve.

Regarding claim 43, as best understood by the examiner, Dietz et al. teach a pump device (102) for the hydraulic actuation of a safety valve (60, 61, 110) on a pipeline used in the production of hydrocarbons, including a discharge pipe (77). According to the combination with Yie, the pump device comprises a body (40) with a cylinder (41) housing a piston (45) such that hydraulic fluid can be pumped under pressure in the cylinder to the actuator (110) of the safety valve, and an electrical drive device (65) movably connected to the piston of the piston-cylinder unit to move the piston in a longitudinal direction inside the cylinder (41). According to the combination with Salina et al., a pressure sensor/switch is provided in the discharge pipe to actuate a relief valve (104) when an overpressure is detected by the sensor/switch.

Regarding claim 44, Dietz et al. teach an apparatus for providing pressurized hydraulic fluid to actuate a valve (60, 61, 110) on a subsea tree used in the production of hydrocarbons, a pump (102) to pump hydraulic fluid, an electrical drive device (see paragraph 25) movably connected to the pump (102) to drive the pump, and an

electrical cable (80) connecting the power source to the electrical drive device. Dietz et al. also teaches a discharge pipe (77) coupled between the piston-cylinder unit and the subsea tree valve to deliver hydraulic fluid thereto, along with a branch pipe (105) and safety valve (104). According to the combination with Yie, Yie teaches a piston cylinder unit having a piston (45) within a cylinder (40) and an electric drive (65) to drive the piston (45) and thereby pressurize hydraulic fluid in the cylinder (40) and force it to the actuator (110) of the valve. According to the combination with Salina et al., a pressure switch is provided in the discharge pipe to actuate the safety valve (104) when an overpressure is detected.

Regarding claim 45, Dietz et al. teach a hydraulic source (see Fig. 24) located subsea and communicating with the pump, in particular the cylinder (40) of Yie for the hydraulic fluid pumping. The examiner notes that "a hydraulic source" is a broad limitation, and reads on any holding area of the incompressible fluid of Dietz et al.

Regarding claim 46, Dietz et al. teach that the pump and electrical drive device are adapted for releasable connection to the body of the subsea tree via threaded joints (47, see paragraph 14).

Claims 2-5 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dietz et al. in view of Yie, Salina et al. and Giese (US 1,852,560).

Regarding claim 2, Yie teaches providing linear movement of the piston either by a drive shaft and cam system (Fig. 7) or by fluid pressure (Fig. 8). However, neither Dietz et al. nor Yie teach a spindle drive and gear system. Giese teaches an electrical

drive which includes a spindle drive (28, 29), a reduction gear (36), a spur gear (35) and a drive shaft (see Figs. 1 and 2) rotated by an electric motor (32). This spindle drive is taught for the purpose of providing linear movement of a piston. One of ordinary skill would recognize that a spindle drive as taught by Giese could be applied to the piston of Yie in the apparatus of Dietz et al. using known methods of construction of mechanical devices, and that it would produce the predictable result of linear motion of the piston. Where a claimed improvement on a device or apparatus is no more than "the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for improvement," the claim is unpatentable under 35 U.S.C. 103(a). Ex Parte Smith, 83 USPQ.2d 1509, 1518-19 (BPAI, 2007) (citing KSR v. Teleflex, 127 S.Ct. 1727, 1740, 82 USPQ2d 1385, 1396 (2007)). Accordingly, Applicant claims a combination that only unites old elements with no change in the respective functions of those old elements, and the combination of those elements yields predictable results; absent evidence that the modifications necessary to effect the combination of elements is uniquely challenging or difficult for one of ordinary skill in the art, the claim is unpatentable as obvious under 35 U.S.C. 103(a). Ex Parte Smith, 83 USPQ.2d at 1518-19 (BPAI, 2007) (citing KSR, 127 S.Ct. at 1740, 82 USPQ2d at 1396. Accordingly, since the applicant[s] have submitted no persuasive evidence that the combination of the above elements is uniquely challenging or difficult for one of ordinary skill in the art, the claim is unpatentable as obvious under 35 U.S.C. 103(a) because it is no more than the predictable use of prior art elements according to their established functions resulting in the simple substitution of one known element for another. The

examiner notes that Giese does not explicitly teach reciprocation. However, one of ordinary skill in the art would recognize that such reciprocation would be necessary between uses of the pump of Giese in its application as a mud gun.

Regarding claim 3, Giese teaches a rotatable, but axially immovable threaded spindle nut (28) threadedly engaging an axially movable threaded spindle (29).

Regarding claim 4, Giese teaches that the threaded spindle is a threaded shaft (29) releasably (see nut in Fig. 2) connected at its actuating end to the piston (17).

Regarding claim 5, Giese teaches that the spindle nut (28) is releasably connected to the reduction gear (36).

Regarding claim 47, Dietz et al. teaches a pump device for the hydraulic activation of a safety valve (60, 61, 110) on a tree used in the production of hydrocarbons, comprising, as taught by Yie, a body (40) with a cylinder (41) housing a piston (45) such that hydraulic fluid can be pumped under pressure in the cylinder to the actuator of the safety valve (110, of Dietz et al.). Further, as taught by Giese, the pump devise comprises an electrical device (32) movably connected to gears (28, 29, 35, 36) for rotating an axially immovable threaded spindle nut (28) threadingly engaging an axially movable threaded spindle (29) connected to the piston of the piston-cylinder unit to move the piston in a longitudinal direction inside the cylinder as the threaded spindle nut (28) threads onto the threaded spindle (29). As above, the discharge pipe (77), relief valve (104), and pressure sensor are taught by the combination with Salina et al.

Claims 6 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dietz et al. in view of Yie, Salina et al. and Giese as applied to their respective parent claims above, and further in view of Flinchbaugh et al. (US 4,398,110).

Regarding claim 6, neither Dietz et al., Yie, nor Giese teach a harmonic drive gear. As a result, neither teaches a flexible cup-shaped toothed sleeve. Flinchbaugh et al. teach an electric actuator including a harmonic gear (see abstract), and indicate generally that harmonic gears provide a high torque to weight ratio (col. 1, ln. 51-55). Speaking generally, harmonic drive gears are well known in the art, and are known to provide an excellent gear ratio in a compact (and thus light as indicated by Flinchbaugh et al.) package. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the gear train of the pump of Giese to include a harmonic drive gear as taught by Flinchbaugh et al., in order to take advantage of the harmonic drive gear's characteristic compactness and lightness. As taught by Flinchbaugh et al., such a harmonic drive gear would include a flexible, cup-shaped toothed sleeve (32) which would be rotationally rigidly connected to the spindle nut (47) of Giese.

Regarding claim 39, in a combination of Dietz et al, Yie, Giese, and Flinchbaugh et al., the reduction gear is a harmonic drive gear as taught particularly by Flinchbaugh et al.

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dietz et al. in view of Yie, Salina et al., Giese and Flinchbaugh et al. as applied to claim 6 above, and further in view of Campbell et al. (US 3,261,591).

Regarding both claims 8 and 9, in the combination, a wave generator (62) as taught by Flinchbaugh et al. would be rotationally rigidly connected to a first spur wheel (49) of Giese, and a second spur wheel (44) would be rotationally rigidly connected to the drive shaft of the motor (50) of Giese. Neither Giese nor Flinchbaugh et al. teach that the spur gear is helically toothed. However, Campbell et al. teach a gear system for a winch, and teach "helical or double helical gear trains interposed between the prime mover and the haulage element dependent on the torque and speed of rotation," (col. 1, ln. 30-32). As a result, it is clear that one of ordinary skill would be aware of the presence of helical and double helical spur gears in the art, and that they would be provide the predictable result of transferring rotation between the drive shaft of Giese to the piston. Further, Giese, Flinchbaugh, and Campbell all provide evidence that the provision of various gears may be accomplished by methods known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a helical or double helical spur gear in the drive train of the pump of Giese as modified by Flinchbaugh et al. and used in the system of Dietz et al., as such a gear would constitute a mere substation of one known element for another to achieve a predictable result.

Claims 36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dietz et al. in view of Yie and Salina et al. as applied to claim 1 above, and also in view of Giese as applied to claim 3 above respectively, and further in view of Hommel (US 6,208,923).

Regarding claim 36, none of Dietz et al., Yie, Salina et al. or Giese teach redundant servomotors. Hommel teaches a fault-tolerant steering mechanism, including a reciprocating element (1) analogous to the piston of Giese, and two servomotors (14a, 14b) arranged to actuate the reciprocating element (1) and arranged in a redundant fashion. Hommel teaches that this provides reliable control of the reciprocation, even in the event of a fault (col. 1, ln. 40-42). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use two redundantly arranged servomotors as taught by Hommel to replace the electric motor of Giese, in order to gain reliability of control.

Regarding claim 38, Hommel teaches a position sensor (3) detects the position of the reciprocating element, which would be the threaded spindle in the present combination.

(10) Response to Argument

Claims 1, 43, 44, and 47 generally relate to hydraulic supply pumps for safety valves used in hydrocarbon production. In the system as disclosed by the applicant, hydraulic fluid is supplied by the pump to a hydraulically actuated valve to actuate the valve and, for instance, cut off flow through a production line. The invention, and to a

certain extent some of the dependent claims, disclose and claim a number of details of the pump in particular, such as gearing and drive mechanisms. However, the majority of the arguments presented thus far by the applicants relate to the overall system rather than to any particular details of the pump itself.

In particular then, claim 1 relates to an electrically driven supply pump having a piston-cylinder unit in which a piston reciprocates to provide fluid to a safety valve, and in which a branch pipe is provided as a relief passage to be opened upon pressure exceeding a certain level within a discharge pipe of the pump. Claims 43, 44, and 47 relate to similar subject matter. However, claim 44 changes the meaning of certain terms, in particular "safety valve," which in claim 1 refers to the hydraulically actuated valve supplied with hydraulic fluid by the pump, but in claim 44 refers to a pressure relief valve within the discharge line of the pump.

The base reference for the rejection, Dietz et al., is directed to a safety valve structure for wells used in hydrocarbon production (paragraph 1). As shown in Fig. 2, the valve as a whole (45) is considered to comprise several general components, specifically a bore closure assembly (60), mechanical linkage (95), fail safe assembly (90) and a drive assembly (75). Dietz et al. then provide several alternative embodiments of those general components including what the reference labels a "hydraulically actuated" embodiment in Fig. 4. Since Dietz et al. do not teach any particular type of pump, the teachings of Yie are relied upon to supply the relevant details. Further, though Dietz et al. are cognizant of the possibility of damage to the components of the hydraulic system (paragraph 26), there is no explicitly provided

safeguard to prevent against failure thereof. For that purpose, the teachings of Salina et al. are relied upon to motivate the provision of a pressure switch capable of generating a signal causing the control valve (104) to open.

In the arguments regarding claim 1, applicant notes an apparent ambiguity with respect to what elements of Dietz are being mapped against the claimed safety valve. For the sake of clarity, the examiner notes that an explicit list of reference signs (60, 61, 110) is provided in the rejection. The description of the teachings regarding the control valve (104) is provided in relation to other limitations of the claim, specifically those regarding the branch pipe and pressure sensor. In the above restatement of the grounds of rejection, that description has been moved for clarity. As such, it has been made clear that the position taken by the examiner is that the claimed safety valve is disclosed by at least the following combination of elements in Dietz et al: bore closure assembly 60, flapper 61, and shaft 110. That being the case, all further remarks by the applicant pertaining to limitations of the control valve (104) of Dietz et al. relative to the limitations of the claimed safety valve will not be addressed further, as they are directed against a position not taken by the examiner.

The applicant argues that because actuation of the flapper (61) is proximately caused by mechanical elements, that it is mechanically actuated rather than hydraulically actuated. However, as noted above, Dietz et al. explicitly consider the embodiments of Figs. 4 and 5 to be hydraulically actuated (paragraph 24). Furthermore, the examiner notes that Dietz et al. considers all of the elements leading to actuation of the flapper 61 to be part of the safety valve (45) as a whole, and that the

examiner's position explicitly includes shaft 110 as part of the safety valve. Effectively, the applicant simply asserts that the rejection relies on flapper (61) alone for disclosing the safety valve, without giving any reason as to why the examiner's position (that the valve comprises 60, 61, and 110) or that of the reference itself (that the valve includes all elements of 45) should be disregarded. Finally, any argument that the system in general or that the flapper (61) in particular is not hydraulically actuated ignores the teachings of the reference that the pump is activated for the express purpose of actuating the mechanical linkage to thereby actuate the flapper.

The applicant also argues that because hydraulic fluid is not delivered to the flapper (61) that the limitations of the claim are not met. As discussed in the rejection above, Dietz teaches a discharge pipe (77) which delivers hydraulic fluid to a bellows (108) to actuate the shaft (110). Since the examiner's position is that the shaft (110) is a component of the safety valve, the discharge pipe (77) is considered to deliver hydraulic fluid thereto, and does so for the explicit purpose of actuating the valve (paragraph 25). And again, Dietz et al. considers the overall installation (45) to constitute a safety valve, so the hydraulic fluid is provided to the valve under that interpretation as well.

The applicant further argues that the jumper line (105) does not satisfy the limitations of the branch pipe, because the hydraulic fluid is not provided to the flapper (61). However, as has been discussed above, hydraulic fluid is provided to the valve at the actuating shaft (110) and is diverted therefrom by the valve (104) through the branch pipe (105). Even in the interpretation of Dietz et al., as modified by Salina, upon

reaching the predetermined pressure level as measured by the pressure switch, the hydraulic fluid would be diverted from providing actuating pressure to the valve, and is thus considered to be diverted from the valve, given the broad scope of the recited limitation.

With respect to the argument that the threaded coupling (47) of Dietz et al. does not constitute a quick release coupling, the examiner notes that there is no generally accepted definition for what does and does not constitute a "quick-release coupling device." The applicant's specification provides an example (57, Fig. 2, see page 14 of applicant's specification, i.e. 3rd full paragraph from the end of the specification) of one type of fitting which the applicant considers to constitute a quick-release fitting. However, the applicant does not provide any limiting definition on the term. As such, reading the term under the broadest reasonable interpretation standard, a threaded coupling is considered to constitute a quick-release coupling, since it is much faster to release a single threaded coupling than it would be to sever a welded joint, for instance.

With respect to claims 43 and 47, the applicant simply points to the alleged deficiencies of the rejection relative to the hydraulic fluid and discharge pipe. As these limitations have been addressed above, the arguments regarding these claims are considered to have been addressed.

With respect to claim 44, the examiner has taken a somewhat different interpretation of the elements of Dietz et al. relative to the claim language, due to the previously noted change in the apparent meaning of the term “safety valve” in claim 44. The examiner notes that claim 44 is independent, and as such, a separate interpretation

using a different mapping of elements against the claim language is entirely proper. In particular, the claimed subsea tree valve of claim 44 is considered to be broadly similar in limitations and function to the safety valve of claim 1, while the safety valve of claim 44 is similar to the branch pipe of claim 1. As such, the position taken by the examiner is that the subsea tree valve of claim 44 is disclosed by the elements of Dietz et al. discussed above (60, 61, 110), and that the hydraulic actuation and fluid provision limitations are fulfilled by the same reasoning outlined above.

The applicant relies on the supposed deficiencies already addressed with respect to the remaining rejections, thus those arguments are considered to have been addressed.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Philip Stimpert/

Examiner, Art Unit 3746

Conferees:
/Devon C Kramer/
Supervisory Patent Examiner, Art Unit 3746
/Sue Lao/
Primary Examiner